

UDC 658.8

JEL Classification: M31

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MARKET ANALYSIS OF DIETARY SUPPLEMENTS: GLOBAL TRENDS AND DEVELOPMENT PROSPECTS IN UKRAINE

РИНОК ДІЄТИЧНИХ ДОБАВОК В УКРАЇНІ: ЕТАПИ РОЗВИТКУ ТА СУЧАСНІ ТЕНДЕНЦІЇ

The purpose of this study is to explore the current trends in the development of the dietary supplements market in Ukraine and globally, and to assess the impact of lawmaking changes and technological innovations on this market. The research methodology involves analyzing literature sources, statistical data, and regulatory acts, with a focus on structuring the gathered information into comprehensive tables. The study results identify key stages in the evolution of the dietary supplements market, the dynamics, and distribution between Ukrainian and foreign manufacturers, and the significant role of modern technologies in product personalization. The practical significance of this research lies in developing recommendations for optimizing the regulatory framework and promoting the adoption of innovative technologies. These measures are essential for enhancing product quality and safety, ensuring market growth, and protecting consumer health. The findings provide a strategic foundation for stakeholders to navigate the evolving dietary supplements market, addressing both current challenges and future opportunities.

Keywords: dietary supplements, Ukrainian market, global market, market regulation, market history, digitalization, market analysis, global trends.

Мета дослідження полягає у визначенні сучасних тенденцій розвитку ринку дієтичних добавок в Україні та світі, а також оцінці впливу законодавчих змін і технологічних інновацій на його функціонування. Актуальність теми обумовлена зростанням попиту на дієтичні добавки, що відіграють ключову роль у профілактиці захворювань і зміцненні здоров'я населення. Важливими також є зміни у законодавстві та впровадження технологій, що впливають на формування нових підходів до виробництва та розповсюдження продукції. Методика дослідження включає аналіз наукових джерел, нормативно-правових актів та статистичних даних. Структуризація та систематизація отриманої інформації дозволили виокремити ключові етапи розвитку ринку дієтичних добавок, а також визначити основні чинники, що впливають на динаміку його зростання. Використано методи контент-аналізу, що дало змогу виявити актуальні тенденції та оцінити їхній вплив на загальний розвиток ринку. Результати дослідження продемонстрували, що ринок дієтичних добавок в Україні проходив через кілька ключових етапів розвитку, таких як формування ринку, регуляція, глобалізація, цифровізація та впровадження інновацій. Було встановлено, що технологічні інновації, включаючи цифрові рішення та персоналізацію, суттєво змінюють структуру ринку та характер споживання продукції. Окрім цього, досліджено взаємозв'язок між законодавчими змінами та впровадженням сучасних технологій з ціллю підвищення якості та безпеки продукції. Практична значущість полягає в розробці рекомендацій щодо подальшого розвитку ринку дієтичних добавок. Особлива увага приділена оптимізації нормативно-правової бази, що сприятиме підвищенню рівня довіри споживачів, а також активному впровадженню інноваційних технологій для покращення якості продукції та забезпечення стійкого зростання ринку. Отримані результати можуть бути використані для формування стратегії розвитку ринку дієтичних добавок, що дозволить ефективніше реагувати на виклики сучасності та забезпечувати високі стандарти продукції.

Ключові слова: дієтичні добавки, український ринок, регуляція ринку, історія розвитку ринку, цифровізація, динаміка і структура ринку.

Problem statement. The need for researching the dietary supplements (hereinafter referred to as DS) market arises from the intensification of three interrelated trends: 1) a significant "rejuvenation" and increase in the number of diseases caused by factors such as a sedentary and stressful lifestyle; 2) growing public awareness of the necessity for chronic disease prevention and the popularity

of a healthy lifestyle; 3) the development of the DS market in response to increasing needs.

Global statistics confirm the rise in disease incidence. According to the World Health Organization (WHO), as of 2022, the most common diseases include cardiovascular disorders, diabetes, hypertension, as well as conditions caused by insufficient intake of essential nutrients. These

chronic diseases account for approximately 74% of the total number of deaths globally [1]. Therefore, it is clear that the role of DS in maintaining health and preventing diseases is significant and will continue to grow [2].

The concept of DS encompasses a wide range of products and substances, including dietary supplements, functional foods, probiotics, prebiotics, enzymes, essential fatty acids, fiber, various herbal and botanical extracts, vitamins, and minerals. It has been proven that regular consumption of DS can prevent key nutrient deficiencies, enhance immune response, and contribute to maintaining optimal human health [3]. Given this, consumer demand for DS is increasing, which in turn stimulates the expansion of their assortment. Manufacturers, responding to the needs and desires of consumers, are offering increasingly broader lines of preventive products, including DS.

Analysis of recent research and publications. The issue of the development of the DS market in Ukraine is extensively covered in scientific publications. Among them, significant attention is given to the works of Dmytryk K. [4 et al.], who analyzes the sales volumes of these products through pharmacies. The Ukrainian DS market has also been studied by Bilan O., Lozova O., and Novikova L. [5 et al.], whose works are dedicated to the development of products for the prevention and treatment of stress. Their research emphasizes the importance of personalized approaches in the selection and use of DS, which aligns with current global trends.

In the works of Kirsanov D. [6–9], changes in the structure of the DS market over the past few years are thoroughly examined, with an exploration of the factors driving demand and sales volumes. The analysis was based on data collected from pharmacies, which allowed the author to identify and describe the main trends in the market's development in Ukraine, with a particular focus on personalization, innovation, and product quality assurance.

Thus, modern studies of the DS market in Ukraine demonstrate that the domestic market continues to develop in line with global trends. However, despite the significant number of publications on this topic, the specific characteristics of its development stages remain insufficiently explored.

Formulating the purposes of the article. The objective of this article is to explore the current trends in the development of the DS market in Ukraine in order to identify and characterize the key stages of its development based on the generalization and systematization of existing data.

Presentation of the main research material. The study of the history of the DS market is crucial for understanding its current state and forecasting future trends. Historical analysis allows for the identification of key factors and events that have shaped the market, determining periods of growth and stagnation, and understanding how changes in social, economic, and technological conditions have influenced the development of the products under study. Understanding the market's history facilitates better analysis of current challenges and opportunities, enabling the formulation of effective development strategies.

It is important to note that although the development of the DS market in Ukraine followed global trends, it progressed much faster, allowing Ukraine to traverse this path in a condensed timeframe and in a concentrated manner (Table 1).

The first stage, "Emergence," was characterized by the formation of an initial, unregulated dietary supplements (DS) market in Ukraine. In the early 1990s, after gaining independence, the Ukrainian market began to see the first DS products, which mostly included vitamins and minerals. These products appeared against the backdrop of a generally low level of public awareness regarding their impact on health and well-being.

Moreover, the emergence of the market occurred in the context of a lack of clear regulatory frameworks concerning the quality and safety of DS. The absence of specialized standards and control led to the entry of products of questionable quality into the market, complicating the process of identifying reliable and effective DS. As a result, this slowed the market's growth and the introduction of products that could promote a healthy lifestyle.

During the second stage, "Formation" (2000 – 2009), there was a significant increase in the popularity of DS in Ukraine. Improved economic conditions contributed to a higher standard of living and increased public awareness of health issues. This period also saw a noticeable rise in

Table 1

Stages of DS Market Development in Ukraine

Stage	Period, Years	Key Characteristics
Emergence	1991 – 1999	Limited assortment, low public awareness, emergence of the first dietary supplements on the market.
Formation	2000 – 2009	Growing popularity of dietary supplements, increased public awareness, and dissemination of health information.
Regulation	2000 – 2020	Establishment of legislative norms: the "Food Safety Law," "Law on the Basic Principles and Requirements for Food Safety and Quality," and others.
Globalization	2010 – 2020	Ukrainian companies entering international markets. Increasing competition from foreign manufacturers.
Expansion, Digitalization, Innovation, and Personalization	2020 – present	Development of online sales, expansion of dietary supplement assortments, emergence of personalized dietary supplement consumption programs. Development of new technologies: artificial intelligence, machine learning, personalization of recommendations.
Popularization of Sustainable Development Ideas	2023 – present	Increased focus on environmentally friendly and ethical dietary supplements. Further development of personalized products and recommendations.

Source: developed by the authors based on the analysis of sources [4; 5; 10; 11]

the availability of information thanks to the development of the Internet and other media resources, which allowed people to become more actively informed about the benefits and importance of DS for maintaining health.

This period was also characterized by the active introduction and expansion of DS assortments in the market. Consumers began to actively use vitamin complexes, dietary supplements, and functional foods that contributed to better nutrition and health. The development of communication channels and increased accessibility of scientific research in the field of DS played a key role in forming positive consumption trends in society.

The third stage, "Regulation," from 2000 to 2020, became crucial for establishing legislative frameworks in the DS field in Ukraine. An important step in this direction was the adoption of the "Food Safety Law" in 2005, which for the first time defined the basic principles of food safety and quality at the national level [10].

In 2014, the following regulatory documents were introduced:

- Order of the Ministry of Health "On the Basic Principles and Requirements for Food Safety and Quality," which detailed the quality and safety standards for food products, including DS;

- The Law of Ukraine "On State Control Over Compliance with Food Legislation, Feed, By-Products of Animal Origin, Animal Health, and Welfare" from 18.05.2017 No. 2042-VIII;

- The Law of Ukraine "On Advertising," as well as the Ministry of Health's Order No. 1114 dated 19.12.2013 "On the Approval of Hygiene Requirements for Dietary Supplements".

These documents contributed to creating a clear market structure and improving consumer rights protection, thereby laying the foundation for ensuring high product quality [11].

This period also witnessed an increase in competition among manufacturers, which stimulated innovation and improvement in production processes. Thanks to regulatory changes, the DS market developed towards greater transparency and alignment with international standards,

which enhanced consumer trust and expanded market opportunities.

The fourth stage, "Globalization," marked a period of active scaling in the Ukrainian DS market. Ukrainian manufacturers began to actively enter international markets, which opened new opportunities for expansion and increased sales volumes. This step contributed to increasing the visibility of Ukrainian brands on the global stage and enhancing their competitiveness.

At the same time, growing competition from foreign manufacturers prompted Ukrainian companies to improve product quality, introduce new technologies, and refine marketing strategies. This also led companies to invest more in research and development to meet the growing demands of global consumers.

As of 2020, an analysis of the DS market in Ukraine revealed a significant increase in sales volumes through pharmacies, indicating an increase in the popularity of these products among the population and a high level of consumer demand [12] (Figure 1).

During the "Expansion" stage (ongoing since 2020), the Ukrainian dietary supplements (DS) market is characterized by several key trends that define its current nature. One such trend is the rapid development of online sales, which began against the backdrop of the COVID-19 pandemic and significantly impacted consumer habits. The digital transformation of commerce has made it more convenient for consumers to access a wide range of DS.

At the same time, there has been an increase in the variety of DS available, including a wide range of products in each category, from traditional vitamin complexes to innovative solutions that meet specific needs, such as supplements for immune support, weight management, and mood enhancement.

Personalization of DS consumption programs is also gaining popularity, primarily through the development of personalized medicine and technologies that allow DS to be tailored to the individual characteristics of each consumer's body [5].

At the current stage of active innovation and digitalization of the DS market in Ukraine, special attention is

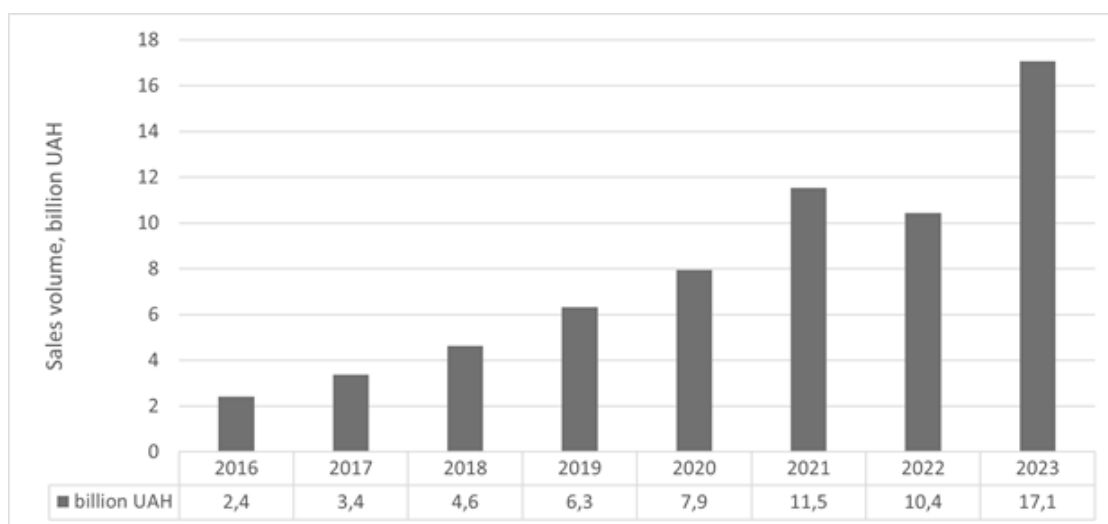


Figure 1. Dynamics of Dietary Supplements Sales Volume in Ukraine, billion UAH

Source: developed by the authors based on the analysis of sources [6-9; 12]

being paid to the application of advanced technologies, particularly artificial intelligence and machine learning. These technologies are integrated into analytical systems for processing large amounts of health data, enabling the identification of personal characteristics and consumer needs. This approach contributes to the development of personalized DS that precisely meet the individual health requirements of each consumer.

Personalization of recommendations is based on a detailed analysis of health indicators, dietary preferences, and genetic data, allowing targeted impact on specific aspects of the body's functioning with maximum benefit to the consumer. This method significantly increases the effectiveness of DS consumption, providing effective solutions to specific health-related issues.

The active implementation of digital innovations in the DS industry opens up prospects for the further development of highly adaptive, safe, and effective products, contributing to the overall improvement of the population's health.

The digitalization process also has another important aspect of influence on the development of the DS market, namely the establishment and expansion of online commerce as the dominant distribution channel. The first online stores specializing in the sale of DS products appeared in the mid-2000s, marking a key moment in the diffusion of innovation in the market. This stage can be considered the beginning of intense consumer engagement in the digital space to meet their health needs.

In the context of the early development of the internet in Ukraine, its penetration rate remained low throughout the 1990s and early 2000s, reaching only 11.5% in March 2005. However, by 2010, this figure had risen to 30%, and by 2021 – to 70% [13], indicating a significant increase in internet access among the population. This growth highlights the critical role of internet penetration in the development of digital commerce and the expansion of consumer access to a wide range of health products.

This trend has led to not only quantitative but also qualitative changes in the market, manifested in the formation of mutually beneficial partnerships between manufacturers

and online retailers. Such cooperation has facilitated the optimization of logistics chains, expanded access to a wide range of products, and adapted offerings to individual consumer demands.

Over time, conglomerates formed in the market, combining several companies into corporations with the aim of expanding production capacities and increasing market share. These organizational transformations were accompanied by the intensive implementation of innovations in all areas of activity, from management to marketing and customer service, which strengthened the competitive advantages of companies in the market and improved the quality of the consumer experience (Figures 2 and 3).

Figure 2 indicates an increase in the presence of foreign manufacturers in the Ukrainian dietary supplements (DS) market, accompanied by a simultaneous decrease in the share of Ukrainian producers. Figure 3 illustrates not only the growing market share of foreign brands but also their dominance in terms of financial turnover compared to local manufacturers. This suggests that foreign manufacturers operate in a higher price category, as they generate higher revenues despite significantly lower sales volumes.

During the "Popularization of Sustainable Development Ideas" stage, the Ukrainian DS market is witnessing an increased focus on producing products that meet high standards of environmental cleanliness and ethics. This includes the use of ingredients from organic sources and ensuring transparency regarding the origin of ingredients, in line with the growing consumer demand for sustainable development and ethical production.

The further intensification of the personalization trend is reflected in the use of modern technologies for collecting and analyzing individual consumer data, particularly information about their health, dietary habits, and genetic profile. This approach significantly enhances the targeted effectiveness of products, allowing for precise responses to individuals' specific needs and minimizing the risks associated with incorrect nutrient intake.

Overall, these innovations contribute to the development of a market characterized by its flexibility in responding to individual consumer needs, offering them the oppor-

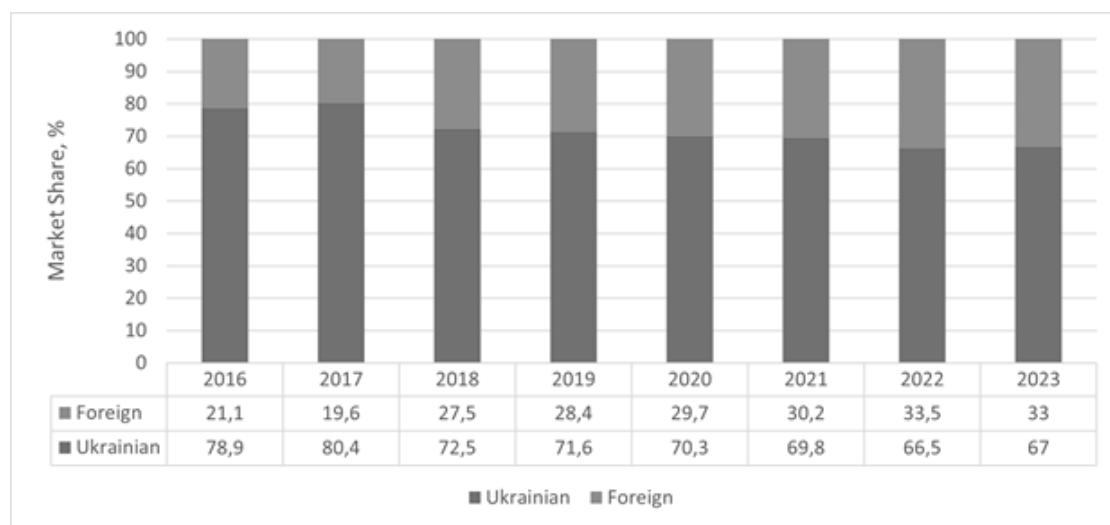


Figure 2. Dynamics of Market Distribution in Ukraine in Physical Terms

Source: developed by the authors based on the analysis of sources [6-9; 12]

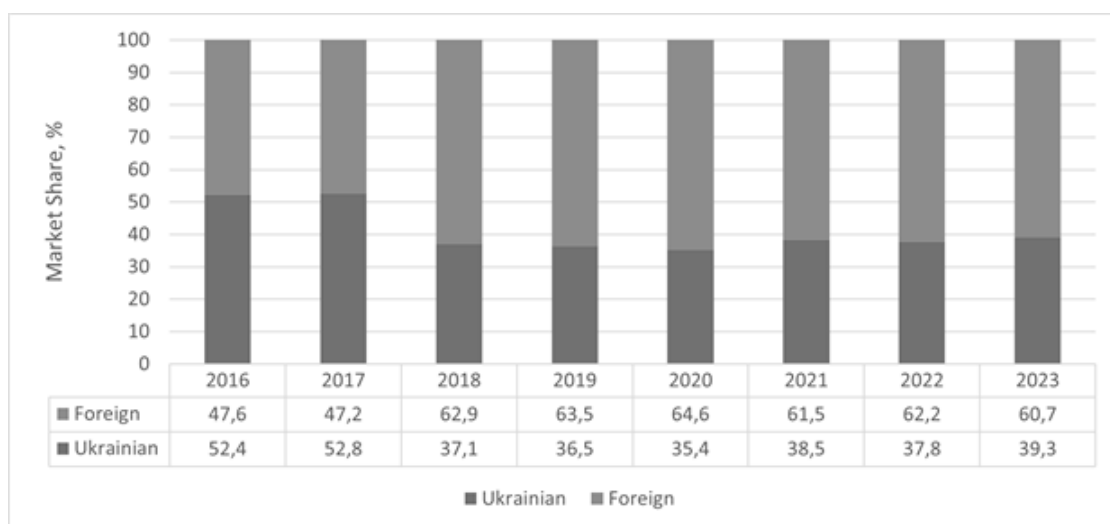


Figure 3. Dynamics of Market Distribution in Ukraine in Monetary Terms

Source: developed by the authors based on the analysis of sources [6-9; 12]

tunity to lead a healthy lifestyle with a particular emphasis on sustainability and personalization. All of the aforementioned factors open new perspectives for the further development of the DS industry and contribute to improving the health, well-being, and overall wellness of the population based on sustainable and individually adapted solutions.

Conclusions. Based on the conducted analysis and the systematization of a substantial amount of scientific and popular science sources, the stages of the development of the dietary supplements (DS) market in Ukraine have been identified. Based on the characteristic features of these stages, they have been named as follows: 1) emergence; 2) formation; 3) regulation; 4) globalization; 5) expansion, digitalization, innovation, and personalization; 6) popularization of sustainable development ideas.

Attention has been focused on the timeliness and appropriateness of regulatory and legislative oversight of the studied market, and the importance of implementing technological innovations to ensure product quality and safety has been emphasized.

Important trends in the DS market have been identified, namely: a significant increase in internet access among the population; active implementation of digital innovations

in the DS industry; growing popularity of these products among the population and high consumer demand for them; increased focus on producing products that meet high standards of environmental cleanliness and ethics. It has been proven that modern technologies, particularly digitalization and artificial intelligence, open new opportunities for the development of the DS market, allowing for enhanced effectiveness of personalized recommendations and adaptation of products to individual consumer needs.

An analysis of the structure and dynamics of the Ukrainian DS market has been carried out, which has demonstrated an increase in the presence of foreign manufacturers and a simultaneous decrease in the share of Ukrainian producers both in natural and monetary terms.

Among the promising areas of research, the following two should be highlighted: 1) an analysis of the directions for improving the regulatory and legal framework and the harmonization of standards, which will contribute to increasing consumer trust and ensuring further growth of the industry; 2) a study of the impact of digitalization on the formation and implementation of marketing strategies and tools for analyzing their effectiveness, which will enhance the competitive positions of enterprises in the market.

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Стаття надійшла до редакції 10.09.2024

Стаття опублікована 09.10.2024